UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/966,121	09/28/2001	J. G. Walacavage	200-0667	4437

7590   05/14/2008

Daniel H. Bliss
Bliss McGlynn P.C.
Suite 600
2075 West Big Beaver Road
Troy, MI 48084

EXAMINER
GEBRESILASSIE, KIBROM K

ART UNIT	PAPER NUMBER
2128	

MAIL DATE	DELIVERY MODE
05/14/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _04 February 2008_.

2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under _Ex parte Quayle_, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-19_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-19_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on _28 September 2001_ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _11/29/2007_.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   This communication is responsive to amended application filed on 02/04/2008.

2.   Claims 1-19 are presented for examination.

Drawings

3.   The drawings are objected to because **Fig. 1, #17, and #16 are illegible**.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to

the Office action to avoid abandonment of the application. Any amended replacement

drawing sheet should include all of the figures appearing on the immediate prior version

of the sheet, even if only one figure is being amended. The figure or figure number of an

amended drawing should not be labeled as "amended." If a drawing figure is to be

canceled, the appropriate figure must be removed from the replacement sheet, and

where necessary, the remaining figures must be renumbered and appropriate changes

made to the brief description of the several views of the drawings for consistency.

Additional replacement sheets may be necessary to show the renumbering of the

remaining figures. Each drawing sheet submitted after the filing date of an application

must be labeled in the top margin as either "Replacement Sheet" or "New Sheet"

pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the

applicant will be notified and informed of any required corrective action in the next Office

action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5.   Claims 1-19 are rejected under 35 U.S.C. 102(e) as being anticipated by US

Patent No. 6, 442, 441 issued to Walacavage et al.

The applied reference has a common assignee with the instant application.

Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art

under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome

either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in

the reference was derived from the inventor of this application and is thus not the

invention "by another," or by an appropriate showing under 37 CFR 1.131.

As per claim 1:

Walacavage discloses a method of using transformational arrays to emulate

model behavior for a programmable logic controller logical verification system, said

method comprising the steps of:

constructing a mechanical model using a computer (such as ...*tools and fixture*

design ...See: Col. 3 lines 9-15, Fig. 1, Fig. 2 #13a, 13b and corresponding texts);

generating transformational arrays for the mechanical model by incrementally

recording one position of each piece of geometry of the mechanical model moved

through space over a period of time using the computer (such as *...neutral control*

models contains a description of interlocks events, which defines the required

dependencies, actions and signals that are associated with sequencing and cycling

*manufacturing tools devices...*See: Col. 2 lines 54-67; Col. 3 lines 1-4);

viewing motion of the mechanical model in a motion viewer based on the

transformational arrays using the computer (See: Col. 3 lines 47-51, lines 59-62, Fig. 1

#14, Fig. 2 #14, #40);

determining whether the motion of the mechanical model is acceptable (such as

*...the control model is good or correct...*See: Col. 4 lines 6-7, Fig. 2 #34 and

corresponding texts);

replicating the motion of the mechanical model by generating a PLC code for the

motion of the mechanical model using the computer if the motion of the mechanical

model was acceptable (such as *....if the control model is good or correct....then*

*automatically generates the PLC code....*See: Col. 2 lines 49-52, Col. 4 lines 6-29, Fig.

2 #15, #36, #38 and corresponding texts); and

using the accepted motion of the mechanical model to compare the behavior of

the PLC code relative to the accepted motion by playing the PLC code with a PLC

emulator (such as *...determines whether the PLC code is good...*See: Col. 4 lines 30-

67; Col. 5 lines 1-2, Fig. 2 #40, #42, 44, and corresponding texts).

As per claim 2:

Walacavage discloses a method as set forth in claim 1 wherein said step of

constructing comprises using a mechanical tool design system to construct the

mechanical model (such as *...tools and fixture design ...*See: Col. 3 lines 9-15, Fig. 1,

Fig. 2 #13a, 13b and corresponding texts).

As per claim 3:

Walacavage discloses a method as set forth in claim 2 including the step of

constructing an electromechanical model (such as *...robot...*See: Col. 3 lines 27-34,

Fig. 1 #13a, 13b and corresponding texts).

As per claim 4:

Walacavage discloses a method as set forth in claim 3 wherein said step of

constructing the mechanical model includes binding the electromechanical model to the

mechanical model (such as *...add robots to interact with the fixture and clamps...*See:

Col. 3 lines 23-34).

As per claim 5:

Walacavage discloses a method as set forth in claim 4 wherein said step of

constructing the electromechanical model comprises using a PLC logical verification

system to construct the electromechanical model (See: Fig. 1 #18 and corresponding

texts).

As per claim 6:

Walacavage discloses a method as set forth in claim 1 wherein said step of

generating transformational arrays comprises generating the transformational arrays

based on computer aided design (CAD) geometries of the mechanical model (See: Col.

2 lines 54-67; Col. 3 lines 1-4).

As per claim 7:

Walacavage discloses a method as set forth in claim 6 including the step of
exporting the mechanical model to a control system design system (See: Fig. 1, Fig. 2
#13a, 13b and corresponding texts).

As per claim 8:

Walacavage discloses a method as set forth in claim 7 including the step of
constructing a motion file based on the mechanical model and transformational arrays
(See: Col. 2 lines 54-67; Col. 3 lines 1-4).

As per claim 9:

Walacavage discloses a method as set forth in claim 8 wherein said step of
displaying further comprises playing the motion file by a motion player (See: Col. 3 lines
47-51, lines 59-62, Fig. 1 #14, Fig. 2 #14, #40).

As per claim 10:

Walacavage discloses a method as set forth in claim 8 including the step of
returning to the mechanical tool design system if the motion of the mechanical model is
not acceptable (See: Col. 3 lines 63-67, Fig. 2 #34 and corresponding texts).

As per claim 11:

Walacavage discloses a method of using transformational arrays to emulate
model behavior for a programmable logic controller logical verification system, said
method comprising the steps of:

constructing a mechanical model using a computer (such as ...*tools and fixture*
design ...See: Col. 3 lines 9-15, Fig. 1, Fig. 2 #13a, 13b and corresponding texts);

generating CAD transformational arrays for motion in the mechanical model by

incrementally recording one position of each piece of geometry of the mechanical model

moved through space over a period of time using the computer (such as *...neutral*

control models contains a description of interlocks events, which defines the required

dependencies, actions and signals that are associated with sequencing and cycling

*manufacturing tools devices...*See: Col. 2 lines 54-67; Col. 3 lines 1-4);

constructing a motion file based on the mechanical model and the CAD

transformational arrays using the computer (such as *neutral control model file or VLE*);

viewing the motion of the motion file in a motion viewer using the computer (See:

Col. 3 lines 47-51, lines 59-62, Fig. 1 #14, Fig. 2 #14, #40);

determining whether the motion of the mechanical model is acceptable (such as

*...the control model is good or correct...*See: Col. 4 lines 6-7, Fig. 2 #34 and

corresponding texts);

replicating the motion of the mechanical model with motion commands in a PLC

code using the computer if the motion of the mechanical model was acceptable (such

as *....if the control model is good or correct....then automatically generates the PLC*

*code....*See: Col. 2 lines 49-52, Col. 4 lines 6-29, Fig. 2 #15, #36, #38 and

corresponding texts); and

using the accepted motion of the mechanical model to compare the behavior of

the PLC code to the accepted motion by playing the PLC code with a PLC emulator

(such as *...determines whether the PLC code is good...*See: Col. 4 lines 30-67; Col. 5

lines 1-2, Fig. 2 #40, #42, 44, and corresponding texts).

As per claims 12-19:

The same rationale will apply as claims 2-7, and 9-10.

Response to Arguments

6.   Applicants' are thanked for amendment/Remarks.

7.   In previous Office action mailed on 10/31/2008 (See: page 2), the drawings have

been objected to. However, no reply has been provided by applicant. Therefore, the

objection is maintained in this Office Action.

8.   Applicants are thanked for amending the claims to overcome the 112, second

paragraph, rejection, and therefore the rejection is withdrawn.

9.   Applicants' arguments relating to art rejection are not persuasive.

        a.   Applicants argued that the prior art fails to disclose *generating*

transformational arrays for the mechanical model by incrementally recording one

position of each piece of geometry of the mechanical model moved through

space over a period of time using the computer.

        Examiner respectfully disagrees. As applicants' indicated a

transformational array described in the specification at page 9 lines 9-12 as:

> general, the method includes generating transformational
> arrays based on CAD geometries during the design phase of the
> machinery for the mechanical model. The transformational
> arrays are movies of manipulation of individual components in
> the mechanical model and are generated with the mechanical
> tool design system 16. These transformational arrays are then
> associated with the particular piece of machine component,
> such as a clamp, throughout the life cycle of the design and
> verification process. It should be appreciated that the

Turning to the prior art of reference, Walacavage et al teaches precisely

what is disclosed in the Applicants specification. For example, Walacavage et al

teaches on Col. 2 lines 54-67, and continue Col. 3 lines 1-8 that:

> The **neutral control model file** is a neutral file that
> contains **a definition of a "control model"**. In general, a
> ***model is typically some representation of critical elements
> of a real entity***. As used herein, the **neutral control model
> file is a representation of the critical elements required
> to control manufacturing tooling**. This term "neutral" is
> meaningful in that the control file used in this process is
> not specific to any one PLC hardware platform nor is it
> specific to any one manufacturing tooling design or process
> planning system. ***The neutral control model file contains a
> description of interlocked events (sometimes referred to as
> networked event) which define the required dependencies,
> actions and signals that are associated with sequencing and
> cycling manufacturing tooling devices***. For example, in
> constructing a vehicle body (not shown) of the motor
> vehicle, **the control model would have individual events
> that described when the conditions were correct for a clamp
> to open or close**. It should be appreciated that **control
> model information from the neutral control model file can
> be readily passed from one manufacturing design system to
> another** as long as all the tool design systems can
> interpret the neutral control model file format, in this
> embodiment, named VLE.

b.   Applicants argued that the prior art fails to disclose *viewing motion of the*

mechanical model in a motion viewer based on the transformational array to

determine whether the motion of the mechanical model is acceptable.

Examiner respectfully disagrees. Examiner would like to direct applicants

to the following portion of the prior art how the above recited limitation disclosed.

For example, Walacavage et al teaches on Col. 3 lines 47-51, lines 59-67, and

Col. 4 lines 1-7 that:

> *The **line verification system** 14 is predominately a
> collector of data and **a viewing tool**, not a creator of
> data. **The line verification system 14 reads neutral
> control model files from the fixture design system 13a
> and workcell design system 13b**.*
> *   **The method then advances to block 32 and plays a
> line model by the line verification system 14, which
> is driven by the control model** described within the
> neutral control model files.*

Applicants also admitted that the prior art of reference discloses

special purpose viewer or motion player such as VisLine in block 40

(See: Remarks (page 10 lines 1-2) filed on 02/04/2008).

Then, Walacavage et al determines whether the motion of the

mechanical model is acceptable as follows:

> After block 32, the method then advances to diamond 34
> and **determines whether a good control model exists by
> the operator 10**.

> *In diamond 34,* **if the control model is good or
> correct, the method advances to block 36**.

c.   Applicants argued that the prior art fails to disclose *replicating a motion of*

a mechanical model by generating a PLC code for the motion of the mechanical

model using a computer if the motion of the mechanical model was acceptable

and using the acceptable model to compare the behavior of the PLC code

relative to the accepted motion by playing the PLC code with a PLC emulator.

Examiner respectfully disagrees. Walacavage et al teaches automatically

generating the PLC code **after** all the motion of the mechanical model was

accepted. All the corrections are made before the PLC code is generated. For

example, Walacavage et al teaches on Col. 4 lines 6-13, lines 30-36, lines 57-67:

> In diamond 34, *if the control model is good or correct, the method advances to block 36* and reads the neutral control model files by a "virtual programmable logic controller" code generator 15. *The method advances to block 38 and automatically generates the PLC code* with the virtual PLC code generator 15 *from the neutral control model files*.
> *The method advances to block 42 and plays a line model by the line verification system 14, which is driven by the PLC code* generated by the virtual PLC generator 15 to analytically verify the PLC code.
> *After block 42, the method advances to diamond 44 and determines whether the PLC code is good.* For example, if a tooling model activity is interrupted or halted while in this PLC analytical verification mode, forcing a tooling model of a clamp to remain in the down position and introducing a non-normal condition, the virtual PLC code generator 16 will have the ability to present diagnostic information that will indicate the potential source(s) of the failed condition.

d.   Further, applicants' argued:

> with a PLC emulator. In Walacavage '441, there is a special purpose viewer or motion player
>
> such as VisLine in block 40, but there is no additional PLC emulator to play the PLC code such
>
> that the user can observe the motion of the mechanical model using the actual PLC code as if
>
> they were watching a machine or manufacturing line of a vehicle assembly plant floor. In

As applicants admitted, Walacavage et al discloses a **viewer or a**

motion player such as VisLine, which has same functionality as "PLC

emulator". Unless, the "PLC emulator" produces a new and unexpected result other than motion playing, there is no patentable significance.

Further, Walacavage et al also teaches the line verification system 14 is a viewing tool, and also plays a line model (See: Col. 3 lines 47-51, lines 56-62).

Conclusion

10.   All claims are rejected.

11.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12.   Examiner's Note: **Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant.** Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures

may apply as well. **It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.**

13.   **In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on** for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

Communications

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kibrom K. Gebresilassie whose telephone number is 571-272-8571. The examiner can normally be reached on 8:00 am - 4:30 pm Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini S. Shah can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. K. G./
Examiner, Art Unit 2128

/Hugh Jones/
Primary Examiner, Art Unit 2128